

FLAME PROPAGATION MODELING METHOD

ABSTRACT OF THE DISCLOSURE

A flame propagation modeling method is provided to accommodate a variety of combustion modes. The flame propagation modeling method defines a flame surface area density to be the flame surface per unit volume and models the flame propagation based on the fact that the progress of the flame transports, generates, and diffuses the flame surface area density. The generation of the flame surface area density, which expresses the progress of the flame, is expressed as flame growth resulting from turbulent combustion and as flame growth resulting from laminar combustion. The flame growth resulting from turbulent combustion is inversely proportional to the chemical reaction characteristic time and is a function of a turbulent Reynolds number. The flame growth resulting from laminar combustion is proportional to both the laminar flame speed and to the ratio of the temperature of a burned portion to the temperature of an unburned portion and is a function of the Karlowitz number.

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